

WHAT IS CLAIMED IS:

1 1. An intake apparatus for an internal combustion engine,
2 comprising:
3 a main section defining an intake port leading to a
4 cylinder of the engine through an intake valve located at a
5 downstream end of the intake port; and
6 a flow regulating section to regulate an intake air flow
7 in the intake port, the flow regulating section including;
8 a partition extending in the intake port in a
9 longitudinal direction of the intake port, and dividing the
10 intake port into first and second passage sections;
11 a gas motion control valve to open and close an
12 upstream end of the second passage section; and
13 a connection passage connecting an upstream end
14 portion of the second passage section to the first passage
15 section.

1 2. The intake apparatus as claimed in Claim 1, wherein
2 the connection passage is opened in the partition.

1 3. The intake apparatus as claimed in Claim 2, wherein
2 the connection passage is in the form of a slit elongated in
3 a direction perpendicular to the longitudinal direction of the
4 intake port.

1 4. The intake apparatus as claimed in Claim 1, wherein
2 the connection passage is in the form of an interspace
3 between an upstream end of the partition and the gas
4 motion control valve in a closed position closing the second
5 passage section.

1 5. The intake apparatus as claimed in Claim 4, wherein
2 the gas motion control valve comprises a first valve portion
3 closing the second passage section, and a second valve
4 portion projecting in the first passage section when the
5 second passage section is closed by the first valve portion.

1 6. The intake apparatus as claimed in Claim 5, wherein
2 the second valve portion of the gas motion control valve
3 closes the connection passage when the gas motion control
4 valve is in an open position opening the second passage
5 section.

1 7. The intake apparatus as claimed in Claim 5, wherein
2 the gas motion control valve comprises a valve shaft
3 located on an extension of the partition, and the first valve
4 portion of the gas motion control valve projects from the
5 valve shaft in one direction and the second valve portion
6 extends from the valve shaft in the opposite direction.

1 8. The intake apparatus as claimed in Claim 5, wherein
2 the second valve portion of the gas motion control valve
3 includes a bent end portion projecting downstream when
4 the second valve portion projects in the first passage
5 section.

1 9. The intake apparatus as claimed in Claim 8, wherein
2 the main section includes an inside wall surface of the
3 intake port, the inside wall surface is formed with a recess
4 receiving the gas motion control valve when the gas motion
5 control valve opens the second passage section.

1 10. The intake apparatus as claimed in Claim 1, wherein
2 the connection passage is open into a low pressure region
3 produced in the first passage section when the second
4 passage section is closed by the gas motion control valve.

1 11. The intake apparatus as claimed in Claim 1, wherein
2 the gas motion control valve comprises a plate element
3 which extends continuously from the partition when the gas
4 motion control valve is in an open position opening the
5 second passage section.

1 12. The intake apparatus as claimed in Claim 1, wherein
2 the gas motion control valve comprises a valve portion
3 projecting in the first passage section when the gas motion
4 control valve is in a closed position closing the second
5 passage section.

1 13. The intake apparatus as claimed in Claim 1, wherein
2 the gas motion control valve closes the connection passage
3 when the gas motion control valve is in an open position
4 opening the second passage section, and the gas motion
5 control valve opens the connection passage when the gas
6 motion control valve is in a closed position closing the
7 second passage section.

1 14. The intake apparatus as claimed in Claim 1, wherein
2 the main section defining the intake port is a casting, and
3 the partition is in the form of a plate inserted as an integral
4 part of the casting.

1 15. The intake apparatus as claimed in Claim 1, wherein
2 the second passage section is smaller in sectional area than
3 the first passage section.

1 16. The intake apparatus as claimed in Claim 1, wherein
2 the second passage section is located below the first
3 passage section in an up-down direction of the cylinder of
4 the engine.

1 17. An internal combustion engine comprising:
2 an engine block member defining an engine cylinder
3 and an intake port leading to the cylinder;
4 an intake valve to open and close a downstream end
5 of the intake port;
6 a gas motion control valve provided in the intake port
7 and arranged to reduce an open sectional area of the intake
8 port to produce a low pressure region in the intake port;
9 and
10 a partition extending in the intake port in a
11 longitudinal direction of the intake port between the
12 downstream end of the intake port and the gas motion
13 control valve, and dividing the intake port into a first
14 passage section and a second passage section which is
15 opened and closed by the gas motion control valve, the
16 partition including an upstream end portion defining;
17 a connection passage connecting an upstream end
18 portion of the second passage section to the low pressure
19 region produced in the first passage section to promote
20 recirculating flow of intake air in the second passage

21 section from a downstream end of the second passage
22 section to the upstream end portion of the second passage
23 section, and from the upstream end portion to the first
24 passage section when the second passage section is closed
25 by the gas motion control valve.

1 18. An intake apparatus for an internal combustion engine,
2 comprising:
3 first means for defining an intake port;
4 second means for dividing the intake port into first
5 and second passage sections extending in a longitudinal
6 direction of the intake port;
7 third means for closing an upstream end of the second
8 passage section and forming a low pressure region in the
9 first passage section; and
10 fourth means for drawing intake air from a
11 downstream end of the second passage section through the
12 second passage section to the low pressure region in the
13 first passage section when the upstream end of the second
14 passage section is closed.